Remarks on certain species of the Lepidopterous genus OPHIDERES, *and their capacity for piercing the epicarp of fruits; by* GEORGE L. PILCHER.

Having seen that the Moths, *Ophideres fullonia*, *materna*, *imperator*, and *salaminia*, have been exciting attention, both in England and France, on account of their supposed power of piercing through the rind of oranges, in order to suck the juices of the fruit, I may, I hope, be pardoned for presenting the results of my own observations as regards the conclusions which have been arrived at.

M. A. Thozet, of Rockhampton, was the author of the letter in the "Rockhampton Bulletin," May, 1875, which is quoted both by Mr. F. Darwin in his paper in the "Journal Microscopical Science," on the Structure of the Proboscis of *O. fullonia*, and also by M. Künckel in his paper, read by M. Emile Blanchard before the French Academy of Sciences, and copied into the "Gardener's Chronicle," though it appears that M. Thozet had written to M. Künckel on the subject before.

M. Thozet states "that *O. fullonia* punctures the rind of the orange, extracts the juice in the corresponding division of the orange, leaving free access to the air, and withdrawing the support to the rind, which, of course, sinks as soon as decomposition begins," and the fruit falls.

Mr. Darwin's and M. Künckel's remarks are on the structure of the proboscis of the moth, and its adaptation to the facts mentioned in M. Thozet's letter.

M. Thozet's letter was replied to by Mr. Miskin, of Brisbane, a well-known entomologist, who utterly repudiated the idea of *O. fullonia* puncturing the oranges, and said, "*O. fullonia* is really only following the well-known habits of its tribe—that of extracting the juice of fruit, which has already been penetrated by the action of other agents, the interior parts being thus exposed to the operations of the moth fraternity, which otherwise, would not be attracted by the fruit." This statement of Mr. Miskin's is in entire accordance with my own observations. Not only do the *Ophideridæ* attack the oranges, but also the ripe guava, peach, and especially the banana ; so much so, that Queensland Lepidopterists take advantage of their well-known tastes to effect their capture. The *modus operandi* is to hang up fully ripe bananas, with *incisions made in the skin*, to which the different species of *Ophideres* (as well as other moths), resort in numbers. Such is the preference of *Ophideres* for the banana, that Mr. Miskin tells me that he has hung up oranges, cut in halves, in close proximity to the bananas, and that the former have not attracted a single specimen, and that those bananas which are ripest, almost fermenting, draw most insects.

M. Künckel describes the proboscis as "a veritable auger," a perfect model of design as a perforating instrument ; whilst, Mr. Darwin says "that the insect must employ a thrusting motion, and not any kind of revolving movement, and the proboscis must accordingly be considered as a saw ;" so that these two observers do not agree at all as to the mode in which the proboscis is used.

Mr. Darwin's theory of a "thrusting motion" seems to me the only motion which is possible, but I cannot myself imagine a more unfitting tool than a saw to perform the operation of making a hole. Would any carpenter attempt to pierce a plank, even with the finest key-hole saw, without first boring a hole right through the wood with a gimlet ?

It was from the examination of the proboscis of the moth some eight years ago, that I first began to doubt the statements about the capability of an insect, fitted with such an instrument, to perforate the tough rind of an orange, though the apparatus appeared adapted for enlarging a hole already existing.

I then made enquiries, and ascertained that the oranges fell off in other colonies in Australia, where the *Ophideridæ* were unknown, and being thus strengthened in my supposition that the moth was, at all events, not the primary enemy of the orange, I endeavoured to find out what was.

I accordingly obtained a number of newly fallen oranges for examination. On squeezing these with the hand, a small drop of juice was seen to exude from the orange, and on opening the corresponding quarter of the orange, two or three maggots were visible, varying in size, according to the stage of growth at which they had arrived ; only the division in which the larvæ were was effected ; the remaining quarters appeared to be sound and eatable. I then enclosed a number of the oranges in boxes with a little sand, and at the end of a fortnight, the fly (of which I have sent two specimens to Mr. Janson)* appeared ; and I thought I could now see how it was that superficial observers had been led to think that the moth was the destroyer of the orange ; whereas it was only an accomplice after the fact. Now also, I could admire the wonderful perfection of the mechanism of the proboscis of the moth, and see how well it was adapted for enlarging a hole already made by some other insect, though totally unfitted for commencing one, and that to this hole it was attracted by the drop of juice exuding from it.

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*These specimens, doubtless referable to the genus *Trypeta*, Meig., I have deposited in the national collection at the British Museum : the species is evidently distinct from any therein extant, its nearest ally appears to be *T. serratulæ*, Linn. (Loew. europ. Bohrfliegen, p. 62, T. x. f. 1).—*Ed.*

The frill of bristles on the dorsal part of the proboscis, would seem to assist in pressing the under rasping surface down upon the object to be operated on. The spines on the lower surfaces are, I think to prevent the insertion of the proboscis to too great an extent, as the moth might not otherwise be able to withdraw it easily, when occasion might require.

When the moth is engaged in sucking, the upper wings are partially opened, and their margins together with those of the lower wings, and the hinder part of the abdomen, seem to be pressed against the fruit; the forelegs raise the head and the fore part of the body, so that there is a considerable interval between the head and the orange or banana, and consequently it is evident that the proboscis is only buried in the fruit to a certain depth.

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